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Liking Goes With Liking: An Intuitive Congruence Between Preference and Prominence

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In a series of 8 experiments, we demonstrate the existence of a "labeling effect" wherein people intuitively relate preferred choices to prominently labeled cues (such as heads as opposed to tails in a coin toss) and vice versa. Importantly, the observed congruence is asymmetric—it does not manifest for nonprominent cues and nonpreferred choices. This is because the congruence is driven by a process of evaluative matching: prominent cues are liked, but nonprominent cues are neutral or at most slightly negative in contrast. When we test prominent, yet truly negatively labeled cues, we indeed find a matching with less liked products. We discuss the theoretical contributions to the study of preferences and decision making, as well as demonstrate the practical implications to researchers and practitioners by using this process to assess intuitive preferences and reduce the compromise effect.

Keywords: preferences, prominence, evaluative matching

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A famous saying suggests that one in doubt, or facing a hard decision, should flip a coin, and while the coin is airborne it would become apparent which face he or she would prefer the coin to land on. Our current research suggests one can do even better. In the current work, we explore an intuitive process in which people implicitly associate their preferred choices with prominently labeled cues. For example, the preferred alternative out of a choice set is associated with the heads face of a coin or the even (as opposed to an odd) outcome of a die roll. We term this phenomenon the "labeling effect" and suggest this could be the result of affective evaluative matching between the favored prominent label and the preference for said alternative. By highlighting this intuitive process, we not only improve our understanding of decision making, but also provide a lens toward uncovering intuitive preferences.

Some labels and cues are more prominent than others; for example, in the pair of labels describing the outcome of a coin-toss, heads is a more prominent label than tails and is more likely to be selected (Bar-Hillel et al., 2014; Schelling, 1960). We propose a possible mechanism in which there is an affect-based congruence between such prominence and preference because of evaluative matching between similarly affective reactions. That is, we expect people to perceive an intuitive match between the positive evaluative judgment of a prominent cue and their preferred product. This account, however, may yield an asymmetry: Cues or labels that are not prominent, being neutral or at most slightly negative in contrast, may not be associated with less preferred choices. For example, heads would be matched with a preferred choice alternative, but tails would have no specific association (more on this below). We reason that some prominently labeled cues elicit positive affect and thus are judged more favorable compared with their less prominent counterparts, due to different mechanisms such as increased fluency (Reber, Winkielman, & Schwarz, 1998), selective attention (Janiszewski et al., 2013), and linguistic markedness (Hamilton & Deese, 1971). Favorable attitude toward a prominent cue facilitates intuitive association with the more favorable alternative in a choice set.

We begin by establishing the theoretical grounds for the proposed congruence, continue with a description of the evidence supporting our predictions, and conclude with a discussion of the conceptual and practical implications of our findings. For the latter, we demonstrate how this mechanism can be used to elicit intuitive preferences and reduce biases caused by deliberation (Pocheptsova et al., 2009).

Prominently Labeled Cues

For many decades now, researchers have been studying influences of stimuli prominence on decisions. As originally demonstrated by Schelling (1960), players in coordination games who cannot communicate with each other were much more successful in coordinating their choices when choosing the focal point of heads over tails, or a prominent traffic New York hub over any other possible meeting location. These findings were replicated in many subsequent studies under controlled conditions and using other labels (see, e.g., Bardsley et al., 2010; Mehta et al., 1994a, 1994b). As noted by Lewis (1969), a prominently labeled cue is one that "stands out from the rest by its uniqueness in some conspicuous respect (p. 35)." Lewis further argues that when

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players have no reasons to prefer one strategy over another, their default choices lean toward a prominent one.

Social sciences do not converge to a specific definition for prominent cues but instead, a range of concepts are offered to explain a variety of related constructs. Lacking a general theory, prominence has remained "a somewhat imprecise term" (Burton & Blair, 1988). A review of prominence studies (Guido, 1998) reveals three main concepts: The principle of *figure-ground* is based on Fiske and Taylor's (1991) assertion that prominence is defined as "the extent to which particular stimuli stands out relative to the others in their environment." Figure-ground prominence depends on the immediate context of the stimuli presentation. For example, bright or moving objects are more likely to capture people's attention in the presence of diluted or static ones. Similarly, isolating an item against a homogeneous background (e.g., similar items) facilitates prominence. *Unusuality prominence* emerges when a stimulus "violates people's prior knowledge and expectations" (Fiske & Taylor, 1991). Examples of unusuality prominence are statistical novelty (e.g., deviation from other examplars or the degree of lack of prior experience), unexpectancy (e.g., incongruity with current knowledge), out-of-role behavior (e.g., behavior that do not fit a person's social identity or position), negativity (negative stimuli usually have stronger affect than positive ones), and extremity. The final source of prominence stems from a combination of a group of potential factors, such as physical properties (e.g., size, position, intensity, frequency), involvement related factors (e.g., relevance to personal goals), or exogenously forced attention. Nevertheless, this umbrella of prominence definitions often falls short of providing solid foundations to precisely define prominence (for an attempt to create a general theory of salience, see Guido, 1998).

As a result, in the current article, we take a practical approach to prominence, and treat a prominent alternative as any alternative that may become a default by virtue of its conspicuousness or psychological prominence (Frederick, 2002). As such, we rely on a common property of prominent stimuli (becoming a default), rather than attempt to trace back the cause for their prominent nature. As described in more details below, psychological prominence is likely to be associated with positive affect, which may explain why many prominent cues become a default: Intuitive affective responses precede more cognitive evaluations, and thus the alternative that elicits the most favorable affective response may enjoy the special status of being the default option, unless one can marshal a decisive case in favor of different alternative (Rothermund & Wentura, 2004). In the same vein, we expect a labeling effect where the unequal prominence of labels of otherwise identical alternatives impacts decisions between these alternatives. We term such cues prominently labeled cues and argue that people are inclined to favor such labels over nonprominent ones. For example, when choosing between 2 six-sided die outcomes that provide an equal chance of winning a prize (e.g., an even vs. an odd outcome), people are expected to prefer *even* over *odd*, because the former constitutes the more prominent alternative (e.g., Kinoshita & Peek-O'Leary, 2006; Lochy et al., 2000; Nuerk, Iversen, & Willmes, 2004) which elicits a more positive affective response.

Three distinct mechanisms may lead to the association between psychologically prominent cues and liking. First, as noted by Rothermund and Wentura (2004), linguistic markedness can give rise to stimuli prominence where default can emerge from the relative location of the stimulus on the scale it represents. For example, we ask "How *tall* are you?," "How *heavy* are you?," and "Did you *like* the movie?" instead of "How *short* are you?," "How *light* are you?," or "Did you *dislike* the movie?" Linguistically, tall, heavy, and liking are the unmarked ends (or labels) and short, light, and disliking are the marked ends of their corresponding scales (Mandler et al., 1987). That is, use of the unmarked end does not imply an existing preconception on the part of the person asking the question, but use of the marked end does. In most, if not all cases, the perceptually positive term is the unmarked end that names the dimension (Klatzky et al., 1973), and therefore will be used as the default.

A second mechanism that may lead to prominence-liking association inherent to some labels is the high fluency-familiarity often characteristic of prominent cues, which, consequentially, affects judgments. For example, Kinoshita and Peek-O'Leary (2006) argue that the more fluently processed category in an Implicit Association Test (IAT; i.e., the more familiar and accessible) becomes the more prominent one. As demonstrated by the mere-exposure effect (Zajonc, 1968), repeated exposure to an initially neutral stimulus increase its liking (for review, see Bornstein, 1989), suggested to be the result of changes in perceptual fluency of stimuli-related information (Bornstein & D'Agostino, 1994; Klinger & Greenwald, 1994; Seamon et al., 1983). Individuals seem to monitor the fluency with which they can extract information from a stimulus such that it becomes hedonically marked: high fluency elicits a positive reaction (Winkielman et al., 2003). Therefore, people may construct a positive affective reaction to a stimulus prior to their feature-based evaluative judgment and independent of it because fluency may serve as a cue that the stimulus has been previously encountered, eliciting a feeling of familiarity (Schwarz & Clore, 1996; Smith, 2000), which, in turn, is associated with processing ease (Jacoby et al., 1989), speed (Haber & Hershenson, 1965; Jacoby & Dallas, 1981), and greater validity (Begg & Armour, 1991). Lastly, to the extent that in many cases prominence is a result of perceptual familiarity, familiarity-positivity association may even be grounded in a biological predisposition for caution in encounters with unfamiliar and therefore potential harmful objects (Zajonc, 1988). This relation is so fundamental that its reversal also holds: increasing positive affect leads to an increase in perceived familiarity (Garcia-Marques et al., 2004; Monin, 2003).

Finally, prominent cues can be thought of as cues that enjoy an increased level of attention. Research into *selective attention* suggests that attentional processes may serve as a source for preference formation, as stimuli we attend to tend to be preferred over those we ignore. For example, an increased attention to a product during the choice process has been shown to increase the likelihood that it would be chosen (Fazio, Powell, & Williams, 1989; Janiszewski et al., 2013; Pieters & Warlop, 1999). Similarly, a prominent brand name, logo, or product packaging that stands out can attract attention and thus increase the preference of the corresponding choice alternative. Importantly, researchers documented reciprocal interactions between selective attention and emotional reactions, two seemingly distinct mental systems. That is, an emotional reaction to stimuli may draw more attention, whereas attentional state can also modulate stimuli liking (Raymond et al., 2003, but see Dittrich & Klauer, 2012). Indeed, neuroimaging

studies have shown that brain structures common to both systems are activated during selective attention and emotional evaluation tasks (e.g., Armony & Dolan, 2002; Pourtois et al., 2013).

In sum, prominently labeled cues may be preferred and more likable than seemingly equivalent alternatives, for at least three possible reasons. However, lack of prominence need not be negative or disliked, it might simply be neutral. For example, while participants in Schelling's (1960) experiments may have experienced positive affect toward heads,[1] they need not have experienced negative affect toward tails. The latter may most likely have elicited a neutral reaction.

Liking Goes With Liking

So far, we presume that prominently labeled cues representing otherwise identical stimuli (e.g., heads or tails outcomes), may be judged more favorable because of an intuitive positive affective reaction. In what comes next, we hypothesize that people associate preferred products with prominently labeled cues through a process of affective evaluative matching. That is, given a choice, people would intuitively relate a prominently labeled stimulus to their preferred product, but not to a less preferred alternative. Put differently, we hypothesize that liking (label) goes with liking (product).

As mentioned earlier, people rely on affective reactions in their decision making (e.g., Schwarz & Clore, 1996), and at times render their feelings as a more diagnostic source of information in the absence of other relevant information to the judgment at hand. This is true even when the affective response is automatically generated, without awareness and regardless of its source. Moreover, this automatically generated affect influences subsequent reactions in favor of valence congruence: People respond faster when the affective valence of the response is congruent with the affective valence of the stimulus, relative to when they are incongruent. For example, participants were faster to respond with a positive (negative) word such as flower (cancer) to stimuli with similar valence, such as gift (cruel; De Houwer & Eelen, 1998). Such evaluative matching is also rooted in the IAT paradigm which rests on the assumption that like valenced concepts are associated with one another (Greenwald, McGhee, & Schwartz, 1998). Similarly, positive or negative affective priming facilitates the evaluation of subsequent target cues with similar valence (De Houwer & Hermans, 1994; for review, see Fazio, 2001; Herring et al., 2013; Klauer & Musch, 2003). We note that the emotional control signals considered here are in the forms of positive versus negative affect, and not in terms of various emotions of the same valence (e.g., joy, happy, pleasant, etc.).

Based on these results, we propose the existence of a correspondence or a natural match between evaluative stimuli generating positive affect. In the context of our work, we expect this affect-based evaluative matching mechanism to yield congruence between preferred choices and prominently labeled cues, two ends with a positive affective reaction. In other words, we expect people to intuitively relate the preferred option in a choice set to a prominently labeled cue, rather than to a nonprominent one. For example, we predict people to intuitively associate a head outcome of a coin toss to a product they prefer because a head label is the more prominent of the two ends, and is likely to generate a more positive hedonic reaction. It is this positive assessment that is matched with the preferred product via evaluative matching. By the same token, we would expect the reverse: People should intuitively relate a prominently labeled cue to a preferred choice alternative, rather than to a less-preferred one, because of the intuitive (and positive) affective reaction it promotes.

Importantly, several mechanisms may cause the complementary process of matching an alternative to a nonprominently labeled cue to result in a null effect. First, nonprominently labeled cues do not evoke a negative affective reaction, and more likely, should be thought of a neutral in that respect. Therefore, it is unclear whether an evaluative matching still occurs in the absence of a valenced affective reaction. That is, if the congruence is driven by the pure affective reactions then one should not expect a congruence between nonprominently, affectively neutral labels, and the less preferred choices. What is more, if the congruence is driven by the relative affective reactions, where nonprominently labeled cues are automatically coded the more negative polarity according to the polarity correspondence principle (Proctor & Cho, 2006), then we should expect at least a minor congruence between nonprominently labeled cues and less preferred alternatives. However, it is possible that absent strong reasons not to, people may favor picking preferred alternatives, a tendency that both enhances the congruence when matching to a prominently labeled cue and may offset the slight congruence of the less preferred outcome to a nonprominently labeled cue. As a result, the minor perceived congruence between nonprominently labeled cues and the less preferred choices may not be observed. In sum, we suggest an affective evaluative judgment process in which people intuitively associate preferred choices with prominently labeled cues but this congruence may not emerge with less prominent labels, as those tend to be perceived as neutral to only slightly negative. However, following the same logic, we do expect a truly negatively valenced labeled cue to be associated with a less preferred product, but those mostly fall outside the main thrust of this investigation (but see Experiment 7).

In what follows we describe eight experiments demonstrating the labeling effect and its properties. Experiment 1 reveals that given two products, participants in a coin-toss game tend to assign the reward they prefer to a heads outcome. Experiment 2 confirms our hypothesis that the effect is asymmetric by showing that phrasing the same task using an assignment to a tails outcome leads participants to an equal assignment of the two rewards. In Experiment 3, participants demonstrated similar behavior under time pressure, supporting the intuitive nature of the effect. Moreover, unlike previous studies in which participants assigned a reward to a coin-toss outcome (heads vs. tails), in Experiment 3 they matched in the opposite direction: They assigned heads or tails to a given reward, exhibiting the bidirectional nature of the congruence. In other words, it does not matter which is being assigned to which, the prominently labeled cue ends up being matched with the preferred reward. Experiment 4 generalizes our results to other prominent labels and provides another conceptual replication. The generalization of the results is further supported

[1] For example, a verification test run in our lab suggests that a head label is more fluent than a tail label. Participants were both faster to recognize "heads" over "tails" embedded in a series of neutral words (541 ms vs. 574 ms, $t(413) = 3.03$, $p = .002$), and were quicker to pay attention to it in a dot-probe task (392 ms vs. 409 ms, $t(519) = 3.98$, $p < .001$).

by Experiment 5 which also addresses natural linguistic primacy as an alternative account. Honing in on the specific mechanism, Experiment 6 focuses on the asymmetric property of the labeling effect and explores whether this could be the result of two countervailing forces as previously explained. Experiment 7 utilizes a contrast between liking and fluency to identify that the evaluative matching occurs between the valence of the cue and the preferred product, as opposed to merely the fluency of the cue. That is, the high fluency of prominently labeled cues facilitates the labeling effect via the positive affective reaction they elicit, we expect a similar affective-based evaluative matching with any affect-eliciting cue, regardless of its fluency level. Finally, by employing this identified process, in Experiment 8 we are able to decrease a well-documented bias in expressed preferences caused by deliberation. Using an assignment to the outcome of a coin toss, we reduce the compromise effect. We conclude with a discussion of the theoretical and practical implications, as well as limitations and directions for future research.

Experiment 1

To explore the proposed congruence between preferred choices and prominently labeled cues, participants in Experiment 1 tossed a virtual coin to determine which of the two possible rewards (a choice between two DVD movies) they would hypothetically win. Before tossing the coin, participants decided which reward they would win if the coin landed on heads and correspondingly, the reward they would win if the coin landed on tails. We manipulated the rewards between participants: Half of the participants saw a pair of DVD movies comprised of a superior one and a medium preference one, while the other half saw the same medium preference DVD paired with an inferior movie. The share of the assignment of the medium preference DVD that was constant across both conditions to the heads coin-toss outcome was the dependent measure. Based on the theory summarized above, we predicted that participants would intuitively favor the assignment of the medium preference DVD to a heads, the prominent label (Schelling, 1960, ch. 3), only when that reward is paired with the inferior movie, that is, only when it is preferred over the alternative.

To establish base preferences for DVD movies as rewards, we conducted the following pretest:

Pretest

One hundred fifty-two online participants were recruited through Amazon MTurk (69% male, M_{age} = 28.72). Participants rated 16 movies from different genres using a 10-star rating system (in half-star increments). We selected the following three movies: *Forrest Gump* ($M_{Forrest\ Gump}$ = 7.19), *The Alamo* ($M_{The\ Alamo}$ = 3.77), and *Superbabies: Baby Geniuses 2* ($M_{Superbabies}$ = 1.63) such that the movie *The Alamo* was rated significantly higher than *Superbabies*, $t(151) = 10.49$, $p < .001$ but it was also rated significantly lower than *Forrest Gump*, $t(151) = 14.27$, $p < .001$. To construct the desired choice set, we used *The Alamo* as the focal (medium preference) choice joined by *Superbabies* and *Forrest Gump*, to construct the focal-preferred (*The Alamo* vs. Superbabies) and focal-not preferred (*The Alamo* vs. *Forrest Gump*).

Design

Four-hundred and three participants were recruited through Amazon MTurk (62% males, M_{age} = 30.5 years), a population similar to the pretest participants. As part of a hypothetical game participants saw pictures of two DVD movie covers and read the following text: "*Consider the movies in the pictures above. Imagine you will be allowed to keep a DVD or Blu-ray of ONE of these movies for yourself. The movie you keep depends on the outcome of a coin flipping game you are about to play. Here is how the game is played: (a) before flipping the coin, you decide which movie you win if the coin lands heads and which movie you win if it lands tails; (b) you flip the coin and win the movie according to your previous decision.*" After confirming their understanding of the game rules, participants were allowed to play the game (Exact on-screen instructions can be found in online supplemental Appendix A). Importantly, we reminded participants that their assignment of a DVD to a heads outcome implies that if the coin lands on tails, they would receive the unselected DVD.

All the participants were offered the movie *The Alamo* (the focal reward) as one of the two reward options, but for half of them it was paired with the movie *Superbabies* and for the other half it was paired with the movie *Forrest Gump*. Note, according to our pretest, the movie *The Alamo* was preferred to its alternative in the first condition, but less preferred to its alternative in the second condition. On the next page, participants were presented with a JavaScript program that allowed them to toss a virtual quarter-dollar coin. They were encouraged to "flip the coin a few times to convince [themselves] it [was] a fair coin." Next, participants saw the movie they previously assigned to heads and received an opportunity to change their choice before tossing the coin, to make sure they were cognizant of their choice. Once ready, they advanced to the actual game page where they tossed the virtual coin, and were presented with their winning—the movie corresponding to the coin-toss outcome.

Additionally, we indirectly measured the relative preference for the movies through participants' self-reported affective states and selling prices. Specifically, participants rated their feeling of happiness, disappointment, and regret on a 7-point scale ranging from *not at all* to *extremely* after they realized the outcome of the game (i.e., which movie they won). Participants also indicated the minimum price they would be willing to "sell" their DVD movie on a \$0–\$26 scale. Following an attention check question, the experiment concluded with a basic demographic questionnaire.

Results

Eleven participants failed to correctly answer the attention check question and were excluded from the analysis.[2]

Manipulation check. We confirmed participants' movie preferences in two different ways, above and beyond the pretest and the choice data reported below: their self-reported affective state as a result of the game outcome and their reported selling prices. To measure participants' affective state, we averaged their self-reported level of happiness, disappointment (reverse-coded) and regret (reverse-coded) to create a *positive affect* index (α = .85).

[2] Including participants who failed the attention check did not change the results ($p < .001$).

Among participants offered the movies *The Alamo* and *Superbabies*, those who "won" the movie *The Alamo* were significantly happier than those who won the movie *Superbabies* ($M_{The\ Alamo}$ = 5.63, $M_{Superbabies}$ = 3.55, $t(197) = 11.51$, $p < .001$). However, among participants offered the movies *The Alamo* and *Forrest Gump*, those who won the movie *The Alamo* were significantly less happy than those who won the movie *Forrest Gump* ($M_{The\ Alamo}$ = 4.37, $M_{Forrest\ Gump}$ = 6.01, $t(191) = 8.94$, $p < .001$). This result replicates and confirms the findings of the pretest. We also used the reported selling price as a proxy for participants' liking of the movies. The average selling price of *The Alamo* was \$7.54. As expected, this price was significantly higher than the average selling price of *Superbabies* ($M_{Superbabies}$ = \$5.69, $t(205) = 3.71$, $p < .001$), but it was also significantly lower than \$8.57, the average selling price of the *Forrest Gump* movie, $t(184) = 1.95$, $p = .05$. Moreover, we observed no difference in the selling price of *The Alamo* regardless of whether it was preferred (\$7.40, relative to *Superbabies*) or not preferred (\$7.69, relative to *Forrest Gump*), $t(197) = .48$, $p = .63$. The selling prices results, again, replicate and validate the relative preference assumptions.

Main results. Out of 199 participants offered the movies *The Alamo* and *Superbabies*, 161 participants (81%) assigned the movie *The Alamo* to a heads. However, when the alternative movie was *Forrest Gump*, out of 193 participants only 65 participants (31%) assigned this very same movie to a heads (see Figure 1). In both cases, the movie assignment to heads, differed significantly from chance, $\chi^2(1) = 76.03$, $p < .001$ and $\chi^2(1) = 20.57$, $p < .001$, respectively. Therefore, participants in our study associated the focal movie of *The Alamo* to the prominent labeled outcome (heads) when it was their preferred choice, but not when it was their less preferred choice. The observed results confirmed our predictions: Combining these results, we find the focal movie being the preferred alternative significantly predicts its assignment to a heads, $\beta = 2.12$, $Z(391) = 8.99$, $p < .001$.

Discussion

Experiment 1 demonstrates the labeling effect: Participants who toss a coin to determine which DVD movie they would hypothetically win, tend to assign the movie they prefer to a heads, a prominent cue. This is in stark contrast to the true probability of 50/50 wining odds that is inherited in a random device such as coin. Keeping the focal reward constant and merely changing its relative preference in the choice set clearly influences the relation between the focal reward and the prominent cue. Only preferred rewards were closely associated with a prominent label. These findings support the idea that the reward-prominent label relation is a function of the relative preference for the reward. A preferred choice appears to be congruent with a prominent label. This apparent congruence may be the result of several potential mechanisms.

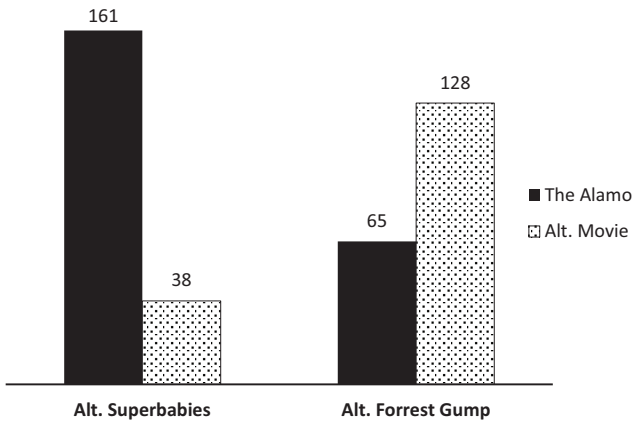

Figure 1. Experiment 1. Number of participants assigning a movie to a heads.

One possible explanation for the apparent congruence is that both preference and prominence are cognitively represented by means of codes and that such codes are hierarchically ordered (Wallace, 1971). Recent work also suggests that many binary stimuli are automatically coded as positive and negative polarities (Proctor & Cho, 2006). Such binary stimuli may include: same–different, true–false, old–new, up–down, and left–right. Therefore, one can assume that compared with a nonprominent label, a prominent one is mentally represented as of a higher order, or even the positive-coded end of the prominence dimension. As a result, compared with a nonprominent label, a prominent one should be mentally endowed with a higher rank. Moreover, preference, by definition, represents rank ordering. Together, the preference-prominence congruence may be seen as merely a result of a pure rank-matching process. If indeed a pure rank-matching process underlies our findings than one should also expect a similar relation between low rank stimuli. Specifically, a nonprominent label (e.g., tails) should be congruent with the less preferred product. However, if our findings are driven by affective evaluative matching, as the above analysis proposes, we would not expect congruence between nonprominent labeled cues and less preferred choice alternatives.

Another alternative explanation might be that individuals assign subjective probabilities to prominently labeled outcomes that are different than their actual chances of winning. Therefore, participants might have assigned their preferred reward to a prominent label simply because they felt it offered them a better chance of winning. Our proposed account, affective evaluative matching, however, should not manifest in biased subjective likelihood of winning, as it suggests that heads feels like a better match for the preferred reward without feeling more likely. Experiment 2 was designed to test these alternative accounts.

Experiment 2

Design

One-hundred people from Amazon MTurk (68% males, M_{age} = 30.8 years) participated in same coin tossing game as in Experiment 1, having to assign their preferred reward of a choice set to the result of a coin flip. In a between-subject design, the difference from Experiment 1 was that some participants assigned one of two movies to a heads outcome, while others assigned one of two movies to a tails outcome. This yielded a two-condition framing factor. Also, unlike Experiment 1, in the current experiment participants in both conditions saw the same pair of movies (screen location counterbalanced): *Forrest Gump* (pretested to be preferred) and *Superbabies* (pretested to be less preferred). Partici-

pants were also asked to directly report their preferred movie. The order of the movie assignment to the coin-flip and preference-reporting tasks was counterbalanced. Lastly, we introduced two questions that required participants to retrospect on their previous decision: Participants used a 7-point scale, ranging from *strongly disagree* to *strongly agree* to indicate the extent to which they felt control over the winning outcome; Participants also indicated their feeling associated with their relative chances of winning each movie using an 11-point scale (see online supplemental Appendix B): Each point on the scale represented the winning probability distribution over the rewards such that the upper number represented the chance of winning *Forrest Gump* and the lower number represented the chance of winning *Superbabies*. The scale ranged from 100%–0% (sure of winning *Forrest Gump*) to 0%–100% (sure of winning *Superbabies*) in 10% steps. For example, the midpoint represented 50/50, whereas the point to the right of it represented 40/60.

After tossing the coin and realizing their wining movie, participants completed the same positive affect index as in Experiment 1, as well as a basic demographic questionnaire.

Results

Manipulation check. In line with our expectations, 95 out of the 100 participants who took the survey indicated they preferred winning the movie *Forrest Gump*, $\chi^2(1) = 81$, $p < .001$.

Main results. Among 49 participants in the heads-frame condition (asking them to assign a movie to the heads outcome), 88% assigned their preferred movie. However, only 53% of the 51 participants in the tails-frame condition assigned the movie they prefer. While the first assignment distribution is significantly different from chance, the second is not, $\chi^2(1) = 27.94$, $p < .001$ and $\chi^2(1) = .18$, $p = .67$, respectively. Moreover, and perhaps more importantly, the distributions of the movie assignments in the two framing conditions differed significantly from each other, $\chi^2(1) = 14.423$, $p < .001$. We further explore whether participants' behavior in the tails-frame condition is simply the symmetrical complement of those in the heads-frame condition as the rank matching alternative mechanism would predict. If the two conditions mirror each other, then the complementary result to the heads-frame condition should correspond to the behavior of those in the tails-frame condition. That is, the heads condition result should also suggest that 88% (1%–12%) would assign the less preferred movie to a tails outcome if the task had been framed using a tails label assignment. It turned out, however, that only 47% of the participants in the tails-frame condition followed this assignment pattern, rejecting the rank matching account, $\chi^2(1) = 78.61$, $p < .001$.

Our design also allowed testing for changes in subjective probability as another alternative mechanism: Did assigning a preferred reward to a prominently labeled outcome lead participants to feel more control over the winning outcome or perceive a higher subjective likelihood of its attainment? Apparently not. The average reported control over the winning outcome did not differ between participants in the heads-frame and those in the tails-frame conditions (2.98 and 3.02, respectively; $t(98) = .12$, $p = .9$). Similarly, participants did not differ in their feeling of their likelihood of winning either movie ($M_{\text{Heads}} = 5.86$, $M_{\text{Tails}} = 5.80$, $t(98) = .03$, $p = .76$).[3] Interestingly, participants in both conditions felt they had a better chance of winning the movie they preferred than the alternative, potentially reflecting general optimism bias, $t(99) = 2.45$, $p = .016$. Finally, a simple subjective probability account would most likely predict a symmetric effect of the heads and tails frames, such that if heads feels more likely, tails feels less so. As stated above, we can reject this symmetric pattern.

Discussion

The results of Experiment 2 replicated the previous findings in the heads-frame condition. The preferred option (*Forrest Gump*) predominated participants' assignments when the task was framed with the prominently labeled outcome (heads). More importantly, the results fell short of supporting the two alternative accounts discussed above. While participants in Experiment 2 associated their preferred choice to the prominent label, they did not reveal a similar relationship between a less preferred choice and a nonsalient label.[4] First, participants' behavior in the two framing conditions seems unlikely to stem from a pure rank-matching mechanism, as such a mechanism predicts symmetry, and our results are strongly asymmetric: The relation between a less preferred choice and a nonprominent label was not influenced by, or at least, not only by, the supposed low-ranking congruence. Indeed, participants' choices in the nonprominent framing condition converge to 50%, the true probability of winning either reward. What is more, a decision that incorporates a nonprominently labeled alternative is not simply the symmetrical complement of one that incorporates a prominently labeled alternative. Holding the choice set constant and merely manipulating the label prominence in the assignment task seems to elicit different behavior. Participants' choices were influenced only in the presence of congruence between two positively evaluated cues: a preferred choice and a prominent cue. Together, Experiment 2's findings lend support to the property of asymmetry in the labeling effect hypothesis.

Finally, although our participants accounted for the equal probability of each of the possible game outcomes only in the tails condition, those in the heads condition did not feel more control over the winning outcome nor did they overestimate their subjective probability of winning their preferred reward. These findings appear to suggest that participants' predisposition to relate a preferred choice to a prominently labeled outcome was not simply the result of different subjective probabilities between the two lotteries.[5] This is notable as one might expect a positive affect–

[3] Also, in both conditions, those who assigned the movie they preferred and those who assigned the movie they did not prefer did not differ in their feeling of control over the winning outcome, $t(98) = 1.02$, $p = .31$, nor the likelihood of winning either movie, $t(98) = .03$, $p = .98$.

[4] To reconfirm the results of Experiment 2, we ran an additional, similarly designed, test that included only the tails assignment condition. Among 50 participants in this experiment, exactly half chose to assign the movie *Forrest Gump* to a tails outcome, although, as expected, most of them (48) indicated it was their favorite movie.

[5] To further substantiate this point, we asked 153 additional participants what would be the most they would be willing to pay for a lottery ticket that offered them to toss a coin and get a $100 for heads and nothing for tails. The average amount ($14.91) did not significantly differ from that of participants who were asked the same question but with reversed rewards for heads and tails ($16.29, $t(151) = .45$, $p = .63$). This reinforces our conclusion that subjective probability is not likely to account for our findings.

optimism relation that exists in other contexts (Alter & Oppenheimer, 2006; Johnson & Tversky, 1983; Song & Schwarz, 2009). Importantly, both the type of chance device we employ and the type and levels of affect in the current investigation differ from context where optimism was demonstrated. We discuss this in greater detail below.

Thus far, we observed that individuals tend to assign preferred rewards to prominently labeled outcomes. We also demonstrated the asymmetry property of the mechanism by noticing that unlike those in the prominent label condition, participants' choices in the nonprominent label condition conformed to the real probability of the game outcomes. We propose that prominent labels can be hedonically marked, facilitating congruence between two positively evaluated ends at an intuitive processing level. We designed Experiment 3 to further explore this hypothesis. First, participants in the first two experiments assigned a reward to a given label, but congruence should be bidirectional. That is, we expect to find similar results whether the task requires an active assignment of a label or a reward. Second, we propose that the effect results from affective evaluative matching, an intuitive process that relies on one's feelings and does not require deliberate thinking. Reliance on one's feeling is particularly apparent under time pressure (Finucane et al., 2000; Siemer & Reisenzein, 1998). If the observed effect is indeed intuitive as we propose, then imposing time constraints should not change our findings. We address these issues in Experiment 3.

Experiment 3

Design

Two-hundred and seventy two undergraduate students from a large public university completed a study about "reaction time and decision making" in exchange for course credits (54% Males, M_{age} = 21.1 years). We used the Media Labs Direct reaction time (RT) v2012 software package for time-sensitive experimental design. Participants first read the instructions of a "betting game" they were about to play in which they could (hypothetically) win different products (see online supplemental Appendix C for the full text). Next, all participants answered three questions that confirmed they understood the rules of the game. The game consisted of 15 consecutive trials of coin toss bets. In each trial, participants first saw pictures of a pair of products in the main area of the screen. For some pairs, one product was clearly preferred over the other (e.g., an iPad vs. a pocket calculator, or a Flat-screen TV vs. a TV stand) while for other pairs of products the preferences were more likely to be subjective (e.g., a Beach vs. a Ski vacation, or a MAC vs. a PC laptop). Participants had 5,000 ms to examine the products after which one of them would be highlighted. The highlighted product was the product they were betting on, which they did by selecting a heads or a tails face to be associated with winning this product in an upcoming coin-toss. As before, not winning the highlighted products meant winning the alternative one. Importantly, a product was highlighted only for 1,000 ms before the page automatically advanced to the next trial. In other words, participants were afforded a one second response window to indicate their heads or tails selection. The goal of the game was to collect as many points as possible according to the following scheme: two points for winning the highlighted product (i.e., participant's selection correctly match an upcoming coin-toss outcome), one point for winning the other product (i.e., no match—winning the alternative product), and no points for not registering a coin face selection within the allotted time. To facilitate a timely response, participants registered their bets using the "A" and "L" keys. The key assignments were counterbalanced so that half of the participants were instructed to use "A" for heads and "L" for tails and the other half were instructed to use "A" for tails and "L" for heads. Additionally, to help participants visualize which key should be used for heads and tails, images of both coin faces were shown at the bottom of the screen ordered (right/left or left/right) in accordance with the key stroke instructions (see screenshot of an example bet in online supplemental Appendix C). A new trial appeared immediately after a participant had registered her selection or the betting time had expired. No choice could be made during the product examination period and before a product had been highlighted. Before participants could advance to the actual game, they engaged in five practice trials: one untimed and four timed trials using different product pairs than those in the actual game. In the second part of the study we measured participants' preferences for the different products. After completing all 15 trials, participant saw the same pairs of products one more time and were asked to "*Select the product that is more appealing to you*." Basic demographics were collected from an unrelated study.

Results

Eighty-six participants failed to answer all three comprehension questions correctly and were excluded from the following analysis.[6] The rest of the 189 participants provided 2,787 observations (i.e., bets) after excluding 50 trials (1.7%) in which no bets have been registered within the 1,000-ms allotted time. We found the same pattern as in the previous experiments: When participants bet on products they preferred over the alternatives, their choices of heads differed significantly from chance (1,124 heads vs. 773 tails, $\chi^2(1) = 64.94, p < .001$), but when they bet on products they liked less, they were indifferent between selecting either heads or tails (469 heads vs. 421 tails, $\chi^2(1) = 2.59, p = .11$). Note this latter result adds to the previous set by demonstrating that without clear preference there is no congruence. We regressed participants' choices on a set of potential exploratory factors. For each bet, we created a dummy variable *Bet on Pref* that received the value of 1 if the highlighted product was also the product the participants reported as more appealing and 0 otherwise. That is, *Bet on Pref* is a binary variable that denotes whether the focal product is the preferred one of the pair. If preference-prominence congruence influences our participants' choices, then we expect *Bet on Pref* to be a significant predictor of selecting a heads. We ran a Logit of participant's choice (heads or tails) on *Bet On Pref* and a dummy indicating the heads assignment keystroke ("A" or "L;" *key assign*). In the full model we also controlled for sequential order of the trial (*seq order*), as well as the response time in milliseconds (*response time*). In both models we also added a participant fixed

[6] We expected a high rate of comprehension failure because of the relatively complicated instructions. However, including all observations in the analysis did not change the results, $\chi^2(1) = 207, p < .001$, and $\chi^2(1) = .92, p = .34$ for betting on the preferred and not-preferred products, respectfully.

effects as a control for potential repeated measure biases. We summarize the results in Table 1. As one can see, the results are robust to the model used and therefore we will only discuss the full model results. It took significantly less time for participants to bet on heads than on tails ($\beta = .0009$, $Z = -2.27$, $p = .02$), confirming the prominent nature of this label. Importantly, whether or not participants bet on the preferred product significantly predicted the heads selection ($\beta = .35$, $Z = 3.66$, $p < .001$). When participants bet on products that were more appealing to them, they were also more likely to bet on heads.

Discussion

In Experiment 3, participants who were asked to assign a coin-face outcome (heads or tails) to one of two possible rewards in each of 15 consecutive choices exhibited the same congruence observed in the previous experiments. When betting on their preferred product, participants favored the prominently labeled outcome (heads). However, when betting on their less preferred product, their choice between heads and tails was unbiased. Importantly, the direction of assignment seems to not matter for the observed congruence. That is, choosing a label (Experiment 3) rather than a product (Experiments 1–2), yields similar results. Moreover, we replicated our results even when participants had only one second to submit their choice, supporting the intuitive nature of the preference-prominence congruence.

Experiment 4

The reported experiments thus far used a variety of products to elicit preference, but a single label (e.g., heads vs. tails). In spite of heads being a well-studied prominent label (Colman, 2003; Mehta et al., 1994; Schelling, 1960), our conceptual account predicts similar congruence effects with other prominent labels. Using other labels can further help generalize our findings by showing that the observed congruence is more than "just" a "heads effect." We test this in Experiment 4 using two other labels: even versus odd (Hines, 1990; Kinoshita & Peek-O'Leary, 2006; Lochy et al., 2000; Nuerk et al., 2004) and card ranks.

Design

One-hundred and forty online participants were recruited through Amazon MTurk (63% males, $M_{age} = 31$ years). Participants were presented with two game scenarios. Each game offered a pair of possible rewards with one clearly preferred over the other. Participants could hypothetically win one of the two rewards with equal probability. In the first game, the rewards were either \$1 or \$5, and before picking a card from a nonstandard deck, participants had to decide which card's rank would win them each reward (e.g., label assignment). In the second game, the rewards were either an iPad or a pocket calculator, and before rolling a standard die, participants had to decide which reward would they win on an even roll and which on an odd one (e.g., reward assignment). Note that we had participants assign a label on the first game and a reward on the second game to test both directions. For example, in the first game, participants read the following description:

> A game allows you to win either \$1 or \$5. The amount you will win depends on the card that you will draw from a well shuffled but a nonstandard pack: The pack contains only eight cards. Four of them are king of spades and the other four are three of spades. Here is how the game is played: Before drawing a card, you decide which card will win you a \$1 and which card will win you a \$5. Then, you draw ONE card from the pack and win the amount represented by the drawn card. Please select the card that will win you a \$1 [\$5]:(this also means the other card will win you a \$5 [\$1])

Participants saw pictures of \$1 and \$5 bills at the top of the screen and pictures of both king of spades and three of spades below the text. They had to select one of the cards, and their order was counterbalanced across participants. Also, we manipulated the assignment to the \$1 prize versus to the \$5 prize between participants. Similarly, on the page describing the second game, participant saw a picture of a standard six-sided die at the top of the screen and pictures of both an iPad and a pocket calculator below the text, and had to select one of the products (display order counterbalanced). Again, assignment to an odd outcome versus to an even outcome was manipulated between participants.

After reporting their selection in game one, participants were also asked to reflect on their previous choice by answering the following questions: (a) "How good do you feel about your choice?" (b) "As a gut-level feeling, how likely are you to win?" (c) "Imagine you drew the card that wins a \$5. How good would you feel?" (d) "Imagine you drew the card that wins a \$1. How bad would you feel?" Participants reported their answers by dragging labeled analog horizontal bars from left to right. For example, the left side of the bar in the first question was labeled *not so good* while the right side was labeled *extremely good*. Participants were asked to reflect on their choice only in the first game scenario. We concluded the survey with a basic demographic questionnaire.

Table 1
Experiment 3: Logit Model of Coin Face Choice on Preference

Variable	β_{Basic}	β_{Full}
Intercept	−.37 (.52)	.09 (.59)
Bet on prey	.36*** (.09)	.35*** (.09)
Key assign	.83 (.76)	.92 (.76)
Seq order		−.008 (.01)
Response time		−.0009* (.0004)
Subject fixed effects	✓	✓
AIC	3537.8	3536.2

Note. Standard errors are presented in parentheses below parameter estimates.
* $p < .05$. *** $p < .001$.

Results

Two participants failed to correctly answer an attention check question and were removed from the analysis.

Game 1. Among those who were asked to choose the card that would win the \$1 prize, 30 participants selected the three of spades card and 38 participants selected the king of spades card—a choice distribution not different from chance, $\chi^2(1) = .94$, $p = .33$. However, choosing a card for the \$5 prize, only 18 participants selected three-of-spades, while 52 selected king-of-spades, which differed significantly from chance, $\chi^2(1) = 16.51$, $p < .001$. Obviously, our participants favored the prominent card (king of spades) when asked to match a label to the preferred reward (\$5).

Conversely, participants did not seem to care which label they assigned to the less preferred reward ($1), again demonstrating the asymmetry predicted by the evaluative matching account. Finally, the choice distributions in the two framing conditions (assignment to $1 or $5 rewards) were significantly different, $\chi^2(1) = 13.02$, $p < .001$. Once again, framing the same task differently affected the way our participants chose a card.

Retrospecting on their choice, participants in the $5 framing condition did not feel significantly better about their choice than those in the $1 framing condition ($M_{\$5} = 66.74$, $M_{\$1} = 62.96$, $t(136) = 1.03$, $p = .3$). Noticeably however, participants who assigned king of spades indicated feeling better about their choice than those who assigned three of spades ($M_{\text{King}} = 68.15$, $M_{\text{Three}} = 60.07$, $t(136) = 2.17$, $p = .031$), but whether participants assigned the card to a $1 or to a $5 prize did not qualify these results, $F(1, 134) = .53$, $p = .46$. This result lends support to the positive affect elicited by the prominent cue. Neither the framing manipulation ($M_{\$5} = 52.33$, $M_{\$1} = 51.83$, $t(136) = .14$, $p = .88$), nor participants' card assignments ($M_{\$5} = 53.14$, $M_{\$1} = 50.53$, $t(136) = .79$, $p = .43$) significantly influenced their gut feeling about their winning likelihood. Finally, participants felt similarly good or bad winning the $5 or $1 reward, respectively, regardless of the framing manipulation ($M_{\$5} = 84.44$, $M_{\$1} = 82.23$, $t(136) = .66$, $p = .5$; $M_{\$5} = 30.28$, $M_{\$1} = 31.07$, $t(136) = .19$, $p = .84$) or their card's assignment ($M_{\text{king}} = 82.95$, $M_{\text{Three}} = 83.92$, $t(136) = .28$, $p = .78$; $M_{\text{King}} = 29.83$, $M_{\text{Three}} = 31.91$, $t(136) = .49$, $p = .62$)

Game 2. Among those who selected a winning reward for the case of an odd die roll, 40 participants selected the iPad and 30 selected the pocket calculator. This choice distribution did not differ from chance, $\chi^2(1) = 1.43$, $p = .23$. However, when asked to select a winning reward for an even die-roll, only 12 participants selected the calculator while 56 selected the iPad, a choice distribution significantly different from chance, $\chi^2(1) = 28.47$, $p < .001$. Once again, our participants favored the preferred reward (iPad) when they had to assign it to the more prominent labeled die-roll outcome (even), but they chose a reward randomly when the task was framed with the nonprominent labeled outcome (odd). Finally, comparing the choice distributions in the two framing conditions (i.e., assigning a reward to an even or an odd outcome) revealed a significant difference, $\chi^2(1) = 10.35$, $p = .001$.

Discussion

The current results further support the asymmetric congruence between preference and prominence. The findings of Experiment 4 verify that there is nothing particularly special about the heads label, and that we find the same effect using other prominently labeled cues. Importantly, Experiment 4 provides more support for both the bidirectional nature of the labeling effect and for its asymmetric property. None of the additional self-reported measures bear any explanatory power on these findings: Participants in the first game felt better about their choice when they assigned the prominent label. However, this pattern did not vary with the reward preference level, and thus suggests that it is less likely that the congruence we find is caused by awareness to a positive emotion. Moreover, neither gut feeling about the chances of winning (a subjective probability measure), nor the expectation of a positive or negative feeling of winning the high or low value prize, respectively, could explain our participants biased choices.

However, one can notice a common characteristic among pairs of labels such as heads–tails and even–odds: Linguistically, the more prominent word precedes the less prominent one. Thus, a potential alternative account to the observed congruence would hold that people simply associate their preferred choice with the label with linguistic precedence. We address this alternative in the following experiment by disentangling label prominence from linguistic primacy, while further generalizing our effect to further prominent labels. In addition, in Experiment 5 we measured subjective prominence, enabling an even stronger test of the underlying congruence.

Experiment 5

Design

Participants from an online panel played 15 trials of a game that offered hypothetical monetary prizes, ranging from $1 to $20. Each trial offered two potential prizes (e.g., $18 and $4) that appeared together with a pair of words (the order of the words was counterbalanced). We selected pairs of words which are commonly used together in English such as *nice–easy*, *body–soul*, and *wait–see*. Following the previous experiments, participants assigned a pair of words to the possible prizes. The outcome of the game was explained to be the result of their assignment and the word that was later selected (randomly) by the computer.

In each game, we asked participants to select the word that, if selected by the computer, would win them the better prize, but also noted they would win the lesser prize if the computer selected the other word (see online supplemental Appendix D). Before participants began the actual trials, they answered a question that confirmed they understood the instructions of the game and engaged in a sample round. After completing all 15 trials, we measured subjective prominence of each word in two ways. In the absolute prominence evaluation task, for each word separately, participants used a 0- to 100-point scale to indicate "How prominent the word is. That is, how likely is this word to stand out or be particularly noticeable?" In the relative prominence evaluation task, participants saw an analog slider scale with the two words as the extreme ends and the marker anchored in the middle; they then indicated how prominent the words were relative to each other, by moving the marker anywhere between the two words. Leaving the slider in the middle indicated no word was more prominent than the other. Overall, participants completed 30 absolute and 15 relative measures of prominence. The survey concluded with basic demographic questions, including an indication for native English speakers.

Results

Four-hundred and eight MTurk workers participated in this study (54% males, $M_{\text{age}} = 32.6$ years). Table 2 depicts the results of all word prominence measurements, both absolute and relative. For clarity, we refer to the order of the words (first vs. second) using the common linguistic order, as they are presented in Table 2, although the order in which they appeared in the choice task, as well as in the absolute prominence evaluation task was counterbalanced. Among the word-pairs selected, we intentionally sought out more cases where the second word is perceived more prominent than the first one, as those would be the critical test to the

Table 2
Experiment 5: Measures of Words Prominence

Word-pair	Relative prominence	First word prominence	Second word prominence	Pairwise comparison
Back–Forth	20.01	32.26	40.28	$t(407) = -6.63$, $p < .001$
Body–Soul	26.85	51.56	64.02	$t(407) = -9.12$, $p < .001$
By–Large	45.40	25.54	52.50	$t(407) = -17.94$, $p < .001$
Dead–Alive	11.37	57.48	60.18	$t(407) = -1.63$, $p = .010$
Front–Center	12.25	45.63	46.27	$t(407) = -.57$, $p = .57$
Lock–Key	3.78	43.84	51.57	$t(407) = -6.17$, $p < .01$
Nice–Easy	17.14	47.98	44.53	$t(407) = -2.82$, $p < .001$
Rain–Shine	−2.00	45.96	56.80	$t(407) = -8.27$, $p < .001$
Read–Write	19.28	42.83	43.31	$t(407) = -.47$, $p = .64$
Shirt–Tie	3.96	40.75	39.68	$t(407) = .93$, $p = .35$
Sooner–Later	−1.94	44.37	37.83	$t(407) = 5.78$, $p < .001$
Touch–Go	−16.44	49.18	44.85	$t(407) = -3.39$, $p < .001$
Wait–See	−2.21	33.84	40.91	$t(407) = -6.40$, $p < .001$
Flesh–Blood	12.09	54.12	61.46	$t(407) = -6.13$, $p < .001$
Silver–Gold	36.22	57.31	70.27	$t(407) = -10.02$, $p < .001$

Note. Relative prominence ranged from −100 (complete prominence of the first word) to 100 (complete prominence of the second word). Columns 3-4 represent the prominence of the first and the second words, respectively, measured separately on a 0–100 scale. Column 5 represents pairwise *t*-test results between the separate measurements of each word pairs. Words that came out significantly more prominent in the test are shaded.

natural order alternative account. We investigate the effect of both relative and absolute prominence measurements using a dataset that consists of 6,128 choices between word pairs. The relative prominence measure ranged from −100, indicating a complete dominance of the first word, to 100, indicating a complete dominance of the second word, where values close to zero indicate that no word in the pair was perceived more prominent. From the absolute prominence measure, we created a prominence index by subtracting the absolute prominence measure of the first word from that of the second word. Therefore, its value-range and interpretation should be identical to that of the relative prominence measure. A logit model of participant's choice (one for the first word and two for the second word) as a function of the prominence measures (either relative or absolute index), participant's gender, age, and participant's English as a native language status, as well as word-pair fixed effects, and participant random effects (to account for repeated measures) revealed the predicted effects: Subjective prominence significantly predicts choice, regardless of how we measured it (see Table 3). That is, given a pair of commonly used words, participants were more likely to assign the word they judged more prominent to the more attractive cash prize, and this effect was robust to the prominence measure procedure (absolute vs. relative) and more important, the congruence was not caused by the natural linguistic order in the word pair. We present the regression results of each pair of words separately in online supplemental Appendix D.

Table 3
Experiment 5: Logit Model Results

Variable	$\beta_{absolute}$	$\beta_{relative}$
Intercept	−1.31 (6.17)	.27 (.19)
Relative prominence		.009*** (.0005)
Absolute prominence	.013*** (.001)	
Gender	−.074 (1.58)	−1.73 (1.61)
Age	.07 (.26)	.21 (.26)
English	−.36 (.68)	−.57 (.69)
Word-pair fixed effects	✓	✓
Subject fixed effects	✓	✓
AIC	8412.6	8274

Note. Standard errors are presented in parentheses below parameter estimates.
*** $p < .001$.

These results not only replicate and extend the previous results in terms of linguistic scope, but also reject a natural linguistic order alternative account. More importantly, they afford a stronger test of the mechanism using measured subjective prominence, demonstrating that the stronger the relative prominence, the stronger the congruence (see Table 3). The results also support noncongruence and an asymmetry when no label (words) in the pair is superior in its prominence. But what if nonetheless, the less prominent label is seen as somewhat negative in comparison with the prominent one as the polarity correspondence principle would predict? That we do not observe a congruence between the less prominent label and the less liked cue suggests that either there is no such polarization, or that it is countered by another opposing force. As discussed above, we posit that when people have no prevailing reason to choose any of the alternatives, they may have a tendency to select the preferred/prominent item. Indeed, such behavior should counteract selection of the less preferred or less prominent alternative, but conversely, enhance selection of the preferred or prominent ones. Experiment 6 was designed to test these premises.

Experiment 6

We proposed that one reason for the asymmetric property of the labeling effect where we observe no congruence when the assignment task is framed with the less prominent/likable label is the cancellation of two opposite effects. Specifically, there might be both a symmetric congruence effect in which people associate preferred alternatives with prominent labels and less preferred

ones with the less prominent counterparts (consistent with Proctor & Cho's, 2006 principle of polarity correspondence), as well as a "favorable-default" effect whereby people tend to select preferred alternatives in the absence of reasons not to.[7] Therefore, we would expect the favorable-default effect to enhance the symmetric congruence effect when assigning a prize to the more likable label (e.g., liking goes with liking effect, plus the tendency to assign what we like), but to be diminished or cancelled, when assigning to the less likable label, because matching the less preferred/less prominent alternative is counteracted by a possible "favorable-default" effect. To investigate this account, Experiment 6 is designed with two distinct goals: First, it explores the existence of a favorable-default effect whereby people tend to select preferred alternatives in the absence of reasons not to. Second, if a favorable-default effect exists, does it interacts with the congruence effect as predicted above? To investigate the first goal, we isolate a potential favorable-default effect from the congruence effect by introducing a new condition to our regular setting in which participants assign a prize to equally liked labels. If there is a favorable-default effect, we expect the probability of assigning the preferred prize to be greater than chance, even in the absence of congruence effect (i.e., when assigning to equally liked labels). We then compare the probability of assigning the preferred prize in the presence and absence of a congruence effect and explore whether adding the effect has a significant impact.

Design

Three-hundred and forty nine online participants (55% males, $M_{age} = 35.2$) took part in a "decision making" study. They played a hypothetical game in which they could win either a ski or a beach vacation. The prize they would win was determine by a randomly drawn card that could have either the letter P or the letter G on it, with equal probability. Between subjects, some participants were asked to select the vacation they would win if the drawn card would be the P card, while others selected the prize they would win if the drawn card would be the G card. Participants were reminded that the cards had equal odds to be drawn and that if the other card is drawn, they would win the other (unselected) prize. After reading the instructions of the game, all participants answered a comprehension question that confirmed they understood the rules of the game, and then proceeded to play the game. Next, participants saw the P and G cards again and reported which card they like more with an option to indicate that the cards were equally liked. Finally, they reported whether they prefer a beach vacation, a ski vacation, or the two prizes are equally preferred. The study concluded with basic demographics.

Results

Only 158 participants correctly answered the comprehension test question and were included in the analysis.[8] Among those, 80 participants indicated that they equally like the P and G cards while 78 indicated they like one card more than the other. Of those who equally liked the cards, 62.5% assigned their preferred vacation in the game to either the P or the G card (depending on the condition), a distribution that was significantly greater than chance, $\chi^2(1) = 5.00, p = .025$. These results support the existence of a favorable-default effect, as participants tended to select the alternative they preferred even in the absence of reasons not to. Importantly, of those who happened to assign a vacation prize to the card they liked more, 82.5% assigned their preferred vacation, a distribution that is not only greater than chance, $\chi^2(1) = 16.9$, $p < .001$, but is also significantly different from those who assigned a vacation to equally liked cards, $\chi^2(1) = 5.00, p = .025$. Therefore, the congruence effect added to and transcended the favorable-default effect as the two-effect account predicts. Finally, only 57.9% of those who happened to assign a vacation prize to the card they like less, selected the prize they prefer, a distribution that does not differ from chance, $\chi^2(1) = .33, p = .94$ but significantly different from that of those who happen to assign a vacation prize to the card they like more, $\chi^2(1) = 4.55, p = .033$, replicating the previous asymmetric results.

Discussion

These results are consistent with our previous observations of an asymmetric effect. Participants selected the prize they preferred significantly more when assigning it to a label they liked more. Importantly, Experiment 6 also helps explain the asymmetric observation by suggesting that an additional effect: The tendency to select the more likable alternative in the absence of reasons not to, interacts with the affective evaluative matching effect, and is able to counter it. That is, a potential match between the label that seems somewhat negative by comparison (i.e., polarization vis a vis the prominent label) and the less liked alternative is subdued by the default favorite effect.

Thus far, we repeatedly find congruence between the prominent label and the preferred product, but the prominent label is for the most part also more fluent. This begs the question of whether preference is congruent because of liking, as the title of the article suggests, or is it, in fact, congruent with fluency, which happened to elicit liking. Our account suggests that fluency facilitates the observed congruence via the positive affective response it elicits. However, this account holds that this congruence is affect-based and fluency is just one potential source of a positive affective response, rather than its main driver. This would imply that any affectively endowed labeled cue should generate such congruence, regardless of its degree of fluency. In other words, it is the affective response that drives the congruency, but not fluency per se. To better identify the underlying process, separate fluency from liking, and demonstrate a boundary condition to the asymmetry, we must diverge to a less applicable domain, and study the effect of fluent, yet negative stimuli. Experiment 7 contrasts the effects of a fluent, yet negative, cue and a positive, yet less fluent one. If the account is indeed a congruence between liking and preference, we should expect the former to associate with the less preferred product, and the latter with the more preferred one.

Experiment 7

Experiment 7 involved a pretest to select appropriate stimuli, and an experiment to test whether the congruence we observe is

[7] We thank Karl Christoph Klauer for this suggestion.

[8] Similar results emerge if we include all participants. However, we believe that using data of participants who did not closely follow the instructions, or were not able to understand the game would have limited value.

between preferences and liked labels, or between preference and fluent ones.

Pretest

One-hundred and forty two undergraduates were invited to take part in a study about "speed and judgement" in exchange for course credit. After reading a short introduction, they were asked to react to a sequence of images by indicating as fast as they could whether each image is positive or negative. To facilitate fast response, participants used the keyboard, by pressing on either "Z" or "/" to report their choices (keystroke assignments to positive and negative were counterbalanced). We used the same software package reported in Experiment 3 to accurately measure response time. Following several practice rounds, participants reacted to 29 different images: Twelve images were black and white animal silhouettes (the focal stimuli for this experiment), and the other 17 images of brands and other stimuli that were pretested for a different project. Each trial began with a display of a centered fixation cross for 2 s, followed by a randomly selected image from the image pool. We measured the valence of each animal by calculating the percentage of participants who indicated it was positive (or negative). We measured each animal's image fluency by calculating the average amount of time it took participants to report whether the image was positive or negative (see Table 4).

Our goal was to select stimuli that were fluent yet had a negative valence, and stimuli that were positive, but not fluent. Following the results, we selected six animals as the main experiment's stimuli. For negative-fluent stimuli, we selected cockroach, scorpion, and spider, which topped the list of negative fluent animals (i.e., it took participants the least amount of time to indicate they were negative). In addition, these animals ranked first, second, and fourth on the negative side of the valence scale: The percentage of participants who tagged them negatively ranged from 89% (cockroach) to 85% (spider). For positive-nonfluent stimuli, we selected turtle, rooster, and camel, which were the least fluent positive animals (i.e., it took participants the greatest amount of time to indicate they are positive). On our valence scale, most participants tagged them positively (placed third, fifth, and sixth), ranging from 65% (camel) to 76% (turtle). see online supplemental Appendix E for all study materials.

Table 4
Experiment 6: Pretest Results

% Report positive		Mean time to report the animal is positive		Mean time to report the animal is negative	
Cockroach	**11%**	Spider	585.05	**Scorpion**	**726.13**
Scorpion	**13%**	Snake	683.14	**Cockroach**	**734.03**
Snake	15%	Bunny	738.37	**Spider**	**742.33**
Spider	**15%**	Horse	773.94	Turtle	746.76
Bat	27%	Cockroach	782.56	Snake	769.47
Shark	46%	Bat	792.45	Bat	795.20
Camel	**65%**	Deer	804.54	Deer	825.32
Rooster	**67%**	Scorpion	848.00	Rooster	885.30
Deer	74%	Shark	860.86	Horse	930.18
Turtle	**76%**	**Rooster**	**868.48**	Camel	934.53
Bunny	82%	**Turtle**	**891.61**	Bunny	940.48
Horse	84%	**Camel**	**978.55**	Shark	969.94

Note. Mean time is reported in ms. Animals selected for the main study are in bold.

Design

We recruited 527 undergraduate students (63% males, M_{age} = 21.2 years) to participate in Experiment 7. The experiment consisted of three major parts: rewards preference measurement, association tasks, and measurement of stimuli valence. In the first part, participants saw three pairs of products, and indicated for each pair which product they preferred. The three product-pairs were: Apple iPhone versus Samsung Galaxy smartphones, ski versus beach vacations, and PC versus Mac laptops. In the second part, we assigned participants to one of two framing conditions: *preferred* and *less-preferred*. Each condition presented three association tasks, one task for each product-pair. In each association task, participants were presented with a product-pair and read a hypothetical scenario in which a game they were about to play offered the chance to win one of the products. In the game, they would draw a card from a pack containing only two animal cards. The drawn animal determines which product they win, but participants had to decide in advance which animal would win them which product. Each association task included a pair of products and a pair of cards, one positive-disfluent card and one negative-fluent card, selected from the pretested stimuli (presentation of animal-cards within each pair was randomly ordered). For example, participants could win either a PC or a Mac laptop by drawing a card from a pack containing a turtle card (positive-disfluent) and a cockroach card (negative-fluent). In the *preferred* framing condition, we asked participants to select an animal card that would win them the product they had previously indicated they preferred. We also noted that drawing the other animal means winning the less preferred product. Correspondingly, in the *less-preferred* framing condition we asked participants to select an animal card that would win them the product they had not preferred. In the last part of the experiment we measured the relative valence of each pair of animal cards by asking participants to indicate which animal image they consider more positive (card presentation was randomly ordered within each pair). We used the following animal pairs: camel–scorpion, turtle–cockroach, and rooster–spider. The order of the questions in all three parts of the experiment was random. After completing demographic questions, participants were thanked and debriefed.

Results

As each participant completed three association tasks, our dataset consisted of 1,581 individual choices. Using the valence measurement, we determined whether or not each choice indeed represented the more likable card between the two animal-cards, as the pretest had indicated. Although our design did not allow for measuring individual fluency, the valence measurement confirmed participants considered camel to be more positive than scorpion (88% selected camel as more positive), turtle more positive than cockroach (98%), and tooster more positive than spider (94%). Table 5 summarizes the percentage of participants who associated the more likable card to either their preferred or less-preferred prizes. The results confirm participants associated the more likable card to their preferred alternative, even when the positive card was

Table 5
Experiment 7 Results: Choice Proportions of the More Positive Card

Framing condition	iPhone vs. Galaxy (Camel/Scorpion)	PC vs. Mac (Turtle/Roach)	Ski vs. Beach vacation (Rooster/Spider)
Preferred framing	67%	87%	72%
Less-preferred framing	33%	28%	35%

less fluent. When asked to select the card that would win them the smartphone, laptop, or vacation they preferred, most participants selected the animal card they deemed more positive, $\chi^2(1) = 37.11$, 182.63 and 61.85, all p's $< .001$, respectively. In contrast, when selecting a card that would win participants their less preferred product, most selected the least-likable card, $\chi^2(1) = 22.33$, 25.08 and 18.51, all p's $< .001$, respectively, suggesting that when a negative affective response to a stimulus is apparent, dislike goes with dislike just as well.

Experiment 7 provides not only additional support for the proposed account with a different set of stimuli and products, but it also sheds light on the particular mechanism. As opposed to the possible congruence between preference and fluency, we find that it is affective evaluative matching that drives the congruency between preference and liking. Unlike prominence, where lack of does not equate to dislike leading to an asymmetric relation, pure disliked cues are indeed matched with the least liked product. These results give rise to an affective-based prominence-preference congruence that is not restricted to a specific source of positive affective response such as fluency. Could marketers use this insight? We posit that beyond the fundamental knowledge of what kinds of cues to associate with one's products, the mechanism of the labeling effect being an intuitive mechanism may be used, in some contexts, to uncover intuitive preferences.

To demonstrate the applicability of the labeling effect, we turn to a well-known bias in decision making that has been shown to be driven by nonintuitive deliberative processing: the compromise effect (Dhar & Simonson, 2003; Pocheptsova et al., 2009; Simonson, 1989). If indeed we can use a matching of a prominent cue to uncover intuitive preferences, we should be able to decrease the compromise effect. Experiment 8 was designed to test this corollary.

Experiment 8

We designed our final experiment to demonstrate a direct implication of the evaluative matching underlying the labeling effect for preference elicitation. Research on judgment and decision making suggests that under some conditions, System 2 processing can be inferior to more intuitive judgments (aka System 2 bias). That is, more cognitive analysis may degrade rather than enhance evaluative validity. For example, consumers have been found to like a product less, the more they analyzed it along several dimensions (Wilson et al., 1993) or the more positive attributes they brought to mind (e.g., Wänke, Bohner, & Jurkowitsch, 1997). A System 2 bias also occurs when some alternatives are selected not because they are more preferred but rather as a way to resolve a difficult decision. The compromise effect (Simonson, 1989) arises when consumers tend to select the middle—or compromise—option as a way to resolve conflict arising from the attributes' trade-offs (e.g., Dhar & Simonson, 2003). As a result, a compromise option is perceived more justifiable. This is despite the compromise clearly violating any normative model of choice, as the addition of a third alternative to a set, should never increase the share of one of the original choice alternatives.

One way to decrease compromising is to manipulate the subjective experience of the decision difficulty, either directly or indirectly (Dhar & Simonson, 2003; Kivetz, Netzer, & Srinivasan, 2004). Another is to directly limit the capacity of System 2 to process the decision (Pocheptsova et al., 2009). It has also been shown that manipulating the subjective experience of difficulty by merely asking subjects to generate only few (as opposed to many) reasons for their choice decreases the effect (Novemsky et al., 2007). Building on the observed labeling effect, we expect that utilizing the intuitive evaluative matching in an indirect choice task should similarly decrease the compromise effect. Specifically, a decision task which requires assigning a choice option to a prominently labeled cue instead of selecting it directly may avoid the System 2 deliberation characteristic of a direct choice task. In an assignment task that involves seemingly identical outcomes, choice justification should not guide individual's decision. Therefore, a task that requires assigning a choice option to a heads outcome instead of its direct selection should be less vulnerable to the compromise effect. Taken together, we propose that the preference–prominence congruence can be used to decrease such System 2 biases. In what follows we test this assertion.

Design

Three-hundred and ninety four respondents (62.5% male, $M_{age} = 32.8$ years) were recruited through MTurk to participate in a short survey on "understanding decisions." We adapted the following materials from one of the tasks reported in Evangelidis and Levav (2013), as both a conservative measure of the compromise effect (both choice sets have three alternatives) and a way to use binary choice in the context of this effect (we did not want to invent a three-sided coin). All participants were presented with two product choices, one pertained to a restaurant and the other to a TV set (in counterbalanced order). To measure individual preferences, we employed either a standard (direct) choice task or a coin flip association task (indirect), which was similar to that used in the experiments above.

Each participant made one direct choice and one indirect choice, presented in a random order. In the restaurant choice task, we asked participants to imagine that they were planning to have dinner with friends in one of three similarly priced restaurants that only differed along two attributes: Driving distance and average quality rating. In the ABC treatment, the three alternatives were: A (21 miles/9.0 stars), B (16 miles/8.1 stars), and C (5 miles/7.3 stars), but we informed participants that Restaurant A was closed for renovation so they had to choose between options B and C. In the BCD treatment, a new option D (3 miles/6.5 stars) replaced option A in the choice set, but was also not available, so once again, participants had to choose between options B and C. Half of the participants chose a restaurant directly and the other half indirectly (counterbalanced across choice tasks). In the TV set task, we asked participants to imagine that they were considering

buying a TV out of a short list of three alternatives; similar to the restaurant scenario logic, here one model was out-of-stock, such that participants had to choose between Models B and C. The TV models varied along two attributes; price and a picture-quality score, respectively: A ($750/92), B ($600/83), C ($450/74), and D ($300/65). As before, half of the participants saw a choice set that comprised of products A, B, and C (ABC choice set) and the other half saw BCD. In sum, each participant chose one restaurant and one TV set, facing either ABC or BCD choice sets, and using one direct and one indirect choice, leading to a 2 (Elicitation Method: Direct Choice vs. Coin Assignment; *between*) × 2 (Choice Set: ABC vs. BCD; *between*) × 2 (Choice Task: Restaurant vs. TV; *within*) mixed design.

Importantly, note that brand C, is the compromise option when the choice set is BCD, but it is not when the choice set is ABC. Therefore, we expect option C, the focal option, to be significantly more popular in the former choice set relative to the latter, corresponding to the bias in the compromise effect. However, we expect the bias to decrease when the choice is made indirectly (via an association task), because of the intuitive nature of the preference-prominence congruence.

Results and Discussion

Table 6 displays the number of participants choosing each option across conditions, options C's choice share, as well as the size of the compromise bias for each of the two products.

Replicating the compromise effect in the direct choice conditions, participants were much more likely to select option C when it was the middle option than when it was not, representing a bias of 29% in the restaurant task and 33% in the TV set task, $\chi^2(1) = 18$, and $\chi^2(1) = 22.42$, p's $< .001$, respectively. Notably, even among those who chose indirectly, the compromise effect did not completely vanish: It was still significant, albeit smaller, in the TV set task, $\chi^2(1) = 10.04$, $p < .01$ and only directional in the restaurant task, $\chi^2(1) = 2.08$, $p = .15$. Most central to the current investigation, employing an indirect choice task reduced the compromise effect by 19% and 13% in the restaurant and TV set tasks, respectively (Table 6, last column). A logit regression of alternative choice (B or C) as a function of choice set (ABC or BCD), elicitation method (direct or indirect), and their interaction, controlling for product (restaurant or TV) as well as an individual fixed effect, reveals a significant interaction between the elicitation method and whether C was the middle option (see Table 7). In other words, the decrease in the compromise choice in the indirect elicitation method relative to the direct method is significant ($p = .01$).

Note, employing an indirect elicitation method significantly reduced the compromise effect, but did not change the likelihood of an alternative to be selected otherwise: When alternative C was the extreme option in the choice set (ABC), its choice shares in the direct and in the indirect elicitation procedures did not differ from each other in both tasks (45% vs. 38%), $\chi^2(1) = 1.12$, $p = .29$ and 25% vs.17%, $\chi^2(1) = 2.13$, $p = .14$, in the restaurant and TV tasks, respectively. However, when alternative C was the middle option in the choice set (BCD) and the compromise effect was likely to manifest as an increase in its share, the likelihood of selecting alternative C was significantly higher in the direct conditions, than in the indirect elicitation procedure (74% vs. 48%), $\chi^2(1) = 14.73$, $p < .001$ and 58% vs. 36%, $\chi^2(1) = 9.30$ $p < .01$, in the restaurant and TV tasks, respectively. Put differently, participants in the direct elicitation procedure were more inclined to select alternative C when it was the middle option. Finally, we note that the distribution of the alternatives assignments to head differs from chance in three of the four indirect choice treatment conditions, supporting our assumption that participants relied on the preference–prominence congruence in their decisions.[9] This latter observation gives credence to the preferences elicited indirectly, as it seems unlikely that the decrease in the compromise bias stems from an increase in random choices or heightened ambivalence.

In sum, Experiment 8 demonstrated one implication of the labeling effect and the intuitive evaluative matching between preferences and prominent labels identified in this work. A useful application can lead to a decrease in biases stemming from deliberation or greater weighting of nonintuitive ques (e.g., Amir, Ariely, & Carmon, 2008; Lee, Amir, & Ariely, 2009).

General Discussion

Understanding preference dynamics has been at the forefront of behavior research, and there is overwhelming evidence that choices are context dependent and can be influenced by the interaction between different types of mental processes and situational cues. We describe eight experiments that explore an intuitive congruence between preference and prominence. All else equal, people intuitively relate their preferred choice to the outcome that is more prominently labeled (and vice versa). We propose a hedonic congruence explanation based on evaluative matching between the valence of the label and preferences, and demonstrate its usefulness for preference elicitation and certain biases reduction.

We construct the preference–prominence congruence hypothesis by bringing together converging insights from previously unrelated fields of research in psychology and judgment and decision making. First, we note that a prominently labeled cue can generate an intuitive positive affective response. This may be the result of three potential mechanisms. Next, we propose intuitive congruence between this positive affective reaction and that of preference. Together, these lead to the prediction that a prominently labeled cue should be intuitively associated with a preferred alternative. Moreover, this relationship should be bidirectional, as a preferred alternative should likewise be associated with a prominently labeled cue. Finally, this congruence does not manifest between nonpreferred alternatives and nonprominently labeled cues, as the latter tend to be neutral rather than negatively affected. We further demonstrate that even when the nonprominent label is perceived as slightly negative in comparison to the prominent one, the "favorable-default" effect may counter the congruence, leading to an overall null effect. Note, however, that a label eliciting significant negative affect is predicted to be associated with the less preferred product. That is, when the stimulus affective response is apparent, people converge to the regular symmetric affective-based evaluative matching (also called affective Simon

[9] Only the distribution of the alternatives assignment to head in the restaurant selection with a BCD choice set did not differ from chance. Nonetheless, this is not necessarily suggesting that the assignment was done randomly since we would expect that employing a less attractive alternative C would lower the likelihood of C being the preferred option which would shift the distribution away from chance.

Table 6
Experiment 8: Compromise Effect Results

Product	Elicitation method	Choice set	Alternative B	Alternative C	$\frac{C}{(B+C)}$	Bias
Restaurant	Direct	ABC	58	48	45%	29%
		BCD	24	71	74%	
	Indirect	ABC	62	38	38%	**10%**
		BCD	53	49	48%	
TV	Direct	ABC	75	25	25%	33%
		BCD	43	59	58%	
	Indirect	ABC	85	17	17%	**20%**
		BCD	63	36	36%	

Note. Columns 4–5 represent the number of participants who selected (direct method) or assigned to a heads outcome (indirect method), in bold alternatives B and C, respectively.

paradigm, e.g., see De Houwer & Eelen, 1998). This latter point is useful for the identification of the specific mechanism, but less so to the usual case of prominent labels for the reasons stated above. This leads to an asymmetry which helps disentangle this mechanism from other related accounts. We tested these predictions across eight experiments.

Participants in Experiment 1 played a game in which they tossed a virtual coin to determine which of two alternative rewards they would hypothetically win. Holding a focal reward constant and manipulating its alternative, we observed that given a choice, participants demonstrated a strong tendency to assign the focal reward to the prominently labeled coin-toss outcome (heads) only when the reward was preferred over the alternative. In Experiment 2, we explored the asymmetry property of the effect in which framing the same task as a tails outcome assignment (a nonprominent label), did not yield the reverse result. Rather, choice proportions in the nonprominent cue frame converged to the otherwise expected chance probabilities: When facing a nonprominent label, participants accounted for the equal probability of the game outcomes and assigned the rewards accordantly. These results were incompatible with a pure rank-matching alternative account. In other words, the effect is not simply mirrored when taking the inverse of its components, as would be predicted by rank-matching. Additionally, participants in the heads frame condition, compared with those in the tails frame condition, did not feel more control over the winning outcome, nor did they feel they had a better chance of winning their preferred reward.

Table 7
Experiment 8: Logit Model Results

Variable	β_{All}	$\beta_{Restaurant}$	β_{TV}
Constant	−.25 (.17)	.72 (.44)	−.53 (.49)
Choice set, BCD	1.43^{***} (.24)	1.3^{***} (.31)	1.44^{***} (.31)
Indirect Elicitation	$-.41^{\dagger}$ (.23)	−.26 (.29)	−.55 (.35)
Choice Set × Indirect Elicitation	$-.70^{*}$ (.32)	$-.88^{*}$ (.42)	−.35 (.46)
Product fixed effects	✓		
Subject random effects	✓		
Gender		−.32 (.22)	−.07 (.23)
Age		−.02 (.01)	−.01 (.01)
AIC	1230.6	534.2	483

Note. Standard errors are presented in parentheses below parameter estimates.
$^{\dagger} p < .1$. $^{*} p < .05$. $^{***} p < .001$.

Experiment 3 explored two essential properties of the congruence account. First, congruence should not have a specific direction and therefore we expected the effect to hold regardless of whether participants assigned a preferred choice to a prominently labeled cue or vice versa. Second, congruence between preferred choices and prominently labeled cues arises from intuitive reactions, thus imposing a time constraint on decision makers should not change our findings. Participants in Experiment 3 performed 15 consecutive choice tasks of a coin-toss game, but in each task participants had only one second to assign either a heads or a tails to a randomly selected reward. Following the assignment tasks, participants also indicated their preferred reward in each pair previously presented to them. The results were consistent with our hypothesis: A task that involved assignment of a label (instead of a reward) yielded the same congruence as that of assignment of reward (to a label). Importantly, we also replicated our previous results even when participants had only 1 s to submit their choice, suggesting that the preference–prominence link is indeed rooted in intuitive processing, and does not require long deliberate thinking. Experiment 4 extended our findings to other prominent labels (i.e., even vs. odd and card ranks), and helped generalize our account beyond coin flips. Experiment 5 lends further support to the generalization of the observed effect but more importantly, it demonstrates people do not necessarily associate their preferred reward with labels with linguistic primacy. Moreover, the congruence followed measured subjective prominence, and was sensitive to the degree of relative prominence, providing strong support for the proposed account. Looking deeper into the asymmetric property of the labeling effect, Experiment 6 explored the "favorable-default" mechanism which interacts with the affective congruence to potentially create a null effect when the task is framed with the less prominent label. Specifically, we observed that people's tendency to select the preferred alternative in the absence of reasons to select otherwise (e.g., when assigning an alternative to a similarly liked labeled cues), counterbalances the evaluative matching effect, resulting in a null effect (an equal choice share for the less prominent label). Experiment 7 was designed to determine whether the evaluative matching happens between the valence of the affective response to the stimulus (e.g., label) or directly with its fluency. To attain this we contrasted fluency with valence, comparing the congruence of a negative but fluent to a positive but less fluent cues with preferences. We find that it is in fact the valence of the stimulus that is being evaluatively matched with preference

and not its fluency level, and that fluency may be one source of a positive affective reaction. In other words, in many contexts fluency may induce sufficient positive response, but is not necessary for the congruence. Moreover, we present a boundary condition in the form of extreme negative affective response being matched to the less prominent label. Finally, Experiment 8 demonstrated an application of the identified mechanism to preference elicitation, enabling a decrease in a well-known bias: the compromise effect. By replacing direct choice with an assignment of the preferred alternative to a heads gamble in a coin toss, we were able to tap into the intuitive evaluation, and circumvent the elaboration and controlled override that have been shown to bias the choice in favor of conflict avoidance and justification. This indirect elicitation procedure significantly decreased the degree of bias in the choices made.

Not all prominent cues generate a positively valenced response. For example, a red traffic light may be intuitively associated with other emotions, the conspicuous Swastika symbol (adopted by the Nazi Party) denotes auspiciousness in Hinduism and other related religions but has strong negative association in the western world, and the number 666, although being salient and fluent by its symmetrical structure, may elicit a strong negative reaction as it represents the "sign of the devil" for some individuals. The effect we document may be limited to prominent labels that generate a positive affective response, and may not generalize to every other form of prominence. We also relied on research in linguistics suggesting that the unmarked ends of marked dimensions usually represent the positive end of the spectrum (Klatzky, Clark, & Macken, 1973). We suspect that our results would generalize to other such unmarked labels, though we only tested a few instances in this article. We caution, though, that there is likely to be cultural or language induced heterogeneity in what might be perceived as prominent. For example, some numerical values carry very differently valenced associations in different cultures or religions (e.g., the number 13). Furthermore, as the root of the observed congruence lies in an intuitive affective response it may be drowned by stronger responses to a task, or overridden by strong controls. In such cases, we do not expect to observe this congruence. We do not expect the preference–prominence congruence to always have the upper hand. Our ability to speak to those is limited by the scope of the current investigation.

While the existing literature and the collected evidence point in the direction of an affect-based evaluative matching mechanism, we cannot fully reject all possible alternative accounts. Our evidence does, however, decreases the likelihood that the observed congruence is caused by a pure rank order matching (Exp. 2, 3, 4), distorted subjective probabilities (Exp. 2, 4), natural linguistic order (Exp. 5), or even a biased sense of control (Exp. 2). Nevertheless, other mechanisms could also play a role in conjunction with the one proposed here and more research into the preference–prominence congruence effect is warranted. Finally, it is likely that there may be boundary conditions we did not investigate, such as high levels of expertise or when a prominent cue itself carries negative associations or affect (e.g., a six-sided die to one who morally opposes gambling).

Our contribution to the existing literature is twofold. At the conceptual level the current work adds to the growing body of knowledge regarding the nature of observed preferences. Demonstrating that people intuitively associate preferences and prominence helps explain why people tend to favor some choices, even in the absence of explicit relevant information or reasons. It is possible that in many cases people intuitively respond to a prominently labeled cue (e.g., a strong brand name) and choose accordingly. In that respect, prominently labeled cues add to the growing list of properties of the context that are worth noting when interpreting contextual influences on decision making.

It may be interesting to note that we do not find evidence for the congruence being related to biased subjective probabilities. That is, we do not find that people think that assignment to a heads label renders their preferred outcome more likely. At first, this may seem at odds with research that finds a relationship between positive affect or fluent processing and optimism (Alter & Oppenheimer, 2006; Johnson & Tversky, 1983; Song & Schwarz, 2009). However, two important distinctions should be noted between the current context and those supporting optimism about future events. The first, is that all the outcomes in our studies revolve around explicit pure chance devices (e.g., coin flips, dice), with known distributions. We do find people to be optimistic about the reward they like, but this optimism does not cloud their assessment of the actual distribution. The second has to do with the scope and locus of the affective response. Whereas most of the above research has people experiencing positive affect in one way or another and making optimistic forecasts, we find people to be matching the positive affect in one cue (e.g., label) to that of another (e.g., reward). That is, the underlying psychological mechanisms are distinct (forecasting–a judgment vs. matching–a choice). Importantly, our results are not immune to such effects in general, but the current context of investigation is probably not ripe with conditions to facilitate such optimism. If anything, we expect such optimism to exaggerate liking based congruencies.

At the practical level, the current account offers researchers and practitioners an additional tool that would help them measure intuitive preferences, which might even be less susceptible to biases, particularly, those biases created by deliberate cognitive processes (e.g., the compromise effect in Experiment 8). For example, when there is a known potential bias, such as social desirability, and a researcher is interested in identifying the intuitive preference, the labeling effect may come in handy. In addition, one may use our findings to better design contextual cues. Finally, our findings underscore the role of aesthetics and beauty, as those have been found to be closely associated with fluency may carry prominence (Reber, Schwarz, & Winkielman, 2004).

We conclude with an extension to the lay belief that a coin flip may help resolve tough decisions because when the coin is in the air, one suddenly realizes what one is hoping for. Our evidence suggests that flipping the coin may not even be necessary as one should simply follow the option he or she assigned to the heads outcome to begin with. Most likely, what one assigned to heads is one's preferred choice.

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